P/2107-278

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:	Confirmation No.: 4925
Stefan Frenzel, et al.	Date: August 12, 2010
Serial No.: 10/539,781	Group Art Unit: 1793
Filed: September 20, 2005	Examiner: Colette B. Nguyen

For: EXTRACTION OF INGREDIENTS FROM BIOLOGICAL MATERIAL

VIA EFS-WEB
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

APPEAL BRIEF PURSUANT TO 37 C.F.R. §41.37

Sir:

This is an appeal from the Final Office Action mailed December 18, 2009 in the above-captioned application. In support of the Notice of Appeal filed June 16, 2010 this Appeal Brief is presented.

Credit card payment for the required fee in the amount of $540.00 for filing this Appeal Brief is submitted via EFS-Web herein.

If this Appeal Brief is filed after a shortened statutory time period has elapsed and no separate Petition is enclosed, the Commissioner of Patents and Trademarks is petitioned, under 37 C.F.R. §1.136(a), to extend the time for filing the Appeal Brief by the number of months which will avoid abandonment under 37 C.F.R. §1.135. The fee under 37 C.F.R. §1.17 should be charged to our Deposit Account No. 15-0700.

In the event the actual fee is greater than the payment submitted or is inadvertently not enclosed, or if any additional fee during the prosecution of this application is not paid, the Patent Office is authorized to charge the underpayment to Deposit Account No. 15-0700.

I. REAL PARTY IN INTEREST:

Südzucker Aktiengesellschaft Mannheim/Ochsenfurt, a corporation organized and existing under the laws of Germany and having a place of business at Maximilanstrasse 10, 68165 Mannheim, Germany, is the assignee of all right, title and interest in and to the instant application, and the invention disclosed therein, by virtue of a duly executed Assignment from the inventors, recorded September 23, 2005 in the USPTO Assignment Branch at Reel/Frame 017012/0529.

II. RELATED APPEALS AND INTERFERENCES:

There are no related appeals or interferences of which Appellants are aware regarding the above-identified application

III. STATUS OF CLAIMS:

Claims 1, 2, 4-19 and 21-28 are pending.

Claims 3 and 20 are cancelled.

Claims 1, 2, 4-19 and 21-28 are rejected under 35 U.S.C. §103 (a).

Claims 1, 2, 4-19 and 21-28 are subject to the present appeal.

IV. STATUS OF AMENDMENTS:

No Amendment has been filed in response to the Final Office Action dated December 18, 2009. Instead, a telephone interview was conducted with the Examiner, Ms. Colette B. Nguyen, and her supervisor, Examiner Curt Mayes on March 2, 2010. As instructed by Examiner Nguyen, an 'Outline of Topics for Discussion During Examiner Interview was forwarded to the Examiner via e-mail on February 23, 2010. No agreement as to the patentability of the claims was reached during the interview. Thereafter, on June 16, 2010 applicants filed a Notice of Appeal From the rejection of claims 1, 2, 4-19 and 21-28 with the required fee.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER:

Claims 1, 2, 4-19 and 21-28 are pending in the application. Claims 1and 18 are directed to a method and are independent. Applicants further argue herein for the separate patentability of method claims 4, 5, 14 and 21-24, as well as claims 10-12 and 17 directed to an apparatus. Claim 10 depends from claim 1 and thus it includes all of the features recited in that independent claim. There are no instances of means-plus-function or step-plus-function terminology under 35 U.S.C. §112, sixth paragraph, in any pending claim.

The following description is provided in accordance with 37 C.F.R. §41.37 (c)(1)(v) , as a concise explanation of the subject matter of the independent claims, as well as of claims 10, 11, 12 and 17, including references to the specification by page and line number and, if applicable, to the figures by reference numeral. This description is illustrative only, and not limiting, of the scope of the claims, nor is it exhaustive of the various embodiments which are encompassed within their scope.

Claim 1 includes as its subject matter:

A method for isolating ingredients from biological material *(see p. 4, lines 4-6 for example)*, comprising the steps of:

electroporating biological material *(see p. 4, lines 12-14 and 21-24 for example)*,

separating off cell juice from the electroporated biological material *(see p. 4, lines 14-16 for example)* under a sufficiently low mechanical loading such that the biological material remains substantially unaltered in its form and character *(see p. 8, lines 13-17 for example)* and is consequently supplied to a subsequent alkaline extraction treatment in such substantially mechanically unaltered form *(see p. 8, lines 17-19 for example)*,

subjecting the electroporated biological material from which the cell juice has been separated off in step b) above to an alkaline extraction treatment *(see p. 4, lines 16-17 and p. 11, lines 23-24 for example)* in which ingredients of said biological material are dissolved out of said material by contacting the material with at least one suitable solvent *(see p. 5, lines 19-25)* at a pH of from about 7 to about 14 *(see p. 11, lines 23-30 for example)* to produce an extract,

obtaining the ingredients of the biological cell material in the cell juice and in the extract *(see p. 4, lines 17-20 for example)*.

Claim 10 includes as its subject matter:

A device for isolating ingredients from biological material according to the method as claimed in claim 1 *(see p. 4, lines 4-7 and p. 17, lines 23-26 for example)*, said device comprising

at least one appliance for electroporation (1) *(see Fig. Item #1, p. 17, lines 26-28 and p. 20, lines 13-14 for example)*,

and at least one extractor (8) *(see Fig. Item #8, p. 17, lines 31-32, and p. 20, lines 20-21 for example)*,

wherein at least one full screw (5) *(see Fig. Item #5 and p. 20, lines 16-17 for example)* for receiving the electroporated biological material *(see p. 7, lines 22-25, p. 17, lines 28-30 and p. 18, lines 8-12 for example)* is arranged between the appliance for the electroporation (1) and the extractor (8) *(see Fig. and see p. 18, lines 8-12 for example)*,

said full screw (5) configured to separate off the cell juice from the electroporated material *(see p. 17, lines 28-31)* under a sufficiently low mechanical loading such that the biological material remains substantially unaltered in its form and character *(see p. 8, lines 13-19 and p. 18, lines 5-13 for example)*,

and is consequently supplied to an alkaline extraction treatment step in such substantially mechanically unaltered form *(see p. 8, lines 17-19 for example)*.

Claim 11 includes as its subject matter:

The device as claimed in claim 10,

wherein the at least one full screw (5) is designed as a conveyor screw *(see p. 7, lines 28-29, p. 18, lines 8-12, p. 21, lines 21-22 and p. 25, lines 2-5 for example)*

and wherein a first section of the screw which is designed for receiving the electroporated biological material is formed at a lower point *(see Fig. and p. 19, lines 28-31 for example)*,

and a second section of the screw which is designed for releasing the conveyed biological material is formed at an upper point *(see Fig. and p. 19, line 31 to p. 20, line 3 for example)*,

of a gradient which exists between said first and said second sections *(see Fig. and p. 20, lines 3-7 for example)*.

Claim 12 includes as its subject matter:

The device as claimed in claim 10, further comprising at least one metering device (6) for metering auxiliary substances *(see Fig. item #6 and p. 19, lines 5-8 for example).*

Claim 17 includes as its subject matter:

The device as claimed in claim 10, wherein the full screw is threaded *(see p. 16, lines 31-32 and p. 17, line 5 for example)* and

at least one of an outer jacket of said screw and said screw threads is perforated *(see p. 18, lines 1-2 and p. 20, lines 16-17 for example).*

Claim 18 includes as its subject matter.

A method for isolating ingredients from a biological material *(see p. 4, lines 4-6 for example)* selected from the group

consisting of chicory and sugar cane *(see p. 12, line 22 and lines 31-32 and p. 15, lines 20-21 and 26-27 for example)*, said method comprising the steps of:

electroporating the biological material *(see p. 4, lines 12-14 and 21-24 for example)*;

separating off cell juice from the electroporated biological material *(see p. 4, lines 14-16 for example)* under a sufficiently low mechanical loading such that the biological material remains substantially altered in its form and character *(see p. 8, lines 13-17 for example)* and is consequently supplied to a solvent extraction treatment in such substantially mechanically unaltered form *(see p. 8, lines 17-19 for example)*;

extracting the biological material from which the cell juice has been separated off in step b) above by dissolving ingredients out of the material upon contacting the material with at least one suitable solvent *(see p. 5, lines 19-23 for example)*; and

obtaining the ingredients of the biological cell material in the cell juice and in the extract *(see p. 4, lines 17-20 for example).*

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following grounds for rejection are presented for review:

1. Whether claims 1, 2, 6-12, 13, 15, 16, 18, 19, 21, 25 - 28 are non-obvious under 35 U.S.C. §103(a) over the proposed combination of U.S. Patent No. 6,656,287 to Sanders ("Sanders") in view of Schultheiss, Processing of Sugar Beets With Pulsed-Electric Fields, *IEEE Transactions on Plasma Science* 30:4 (2002), pp. 1547-1551 ("Schultheiss").

2. Whether claims 4, 5, 14, 17, 21-24 are non-obvious under 35 U.S.C. §103 (a) over the proposed combination of Sanders in view of Schultheiss, and further in view of EP 1257413 (corresponding to WO/0162482) (cited by the Examiner as, "Eugene et al.").

VII. ARGUMENT:

A. Claims 1, 2, 6-9, 13, 15, 16, 18, 19, 21 and 25-28 are non-obvious under 35 U.S.C. §103 (a) over the proposed combination of Sanders in view of Schultheiss

In the final Office Action dated December 18, 2009 claims 1, 2, 6-9, 13, 15, 16 18, 19, 21 and 25-28 are rejected under 35 U.S.C. §103(a) over Sanders in view of Schultheiss. Claims 1 and 18 are written in independent form. Claim 1 is directed to a method for isolating ingredients from biological material. The method involves: a) electroporating the biological material; b) separating off cell juice from the electroporated biological material under a sufficiently low mechanical loading such that the biological material remains substantially unaltered in its form and character and is consequently supplied to a subsequent alkaline extraction treatment in such substantially mechanically unaltered form; c) subjecting the electroporated biological material from which the cell juice has been separated off in step (b) to an alkaline extraction treatment in which ingredients of said biological material are dissolved out of said material by contacting the material with at least one suitable solvent at a pH of from about 7 to about 14 to produce an extract; and d) obtaining the ingredients of the biological cell material in the cell juice and in the extract.

Claim 18 is also directed to a method for isolating ingredients from biological material. Claim is almost identical to claim 1 (see above) except for two features. In the first instance the biological material in claim 18 is recited as being selected from the group consisting of chicory

and sugar cane. In the second instance, step c), i.e., the extraction step, of claim 18 does not require that the extraction be an alkaline extraction treatment. That is, step c) in claim 18 recites extracting the biological material from which the cell juice has been separated off in step b) above by dissolving ingredients out of the material by contacting the material with at least one suitable solvent. Otherwise, i.e., except for these differences, claim 18 recites the same steps in the same manner as in claim 1.

According to the Examiner's remarks concerning applicants' independent process claims 1 and 18 at, respectively, pp. 2-4 and 5-7 of the final Office Action dated December 18, 2009, the Sanders reference is cited due to its disclosure with regard to a process system to produce sugar from plant materials, such as sugar cane, sugar beets and chicory. The Examiner acknowledges, however, that the reference does not specify the use of electroporation. The Examiner has thus combined the Schultheiss reference, which does disclose to electroporate plant material, to supply the element of the claimed method that is missing from Sanders.

The Examiner states, in the portions of the final Office Action dealing with the rejection of both independent claim 1 and independent claim 18 (see p. 2 and p. 6) that, "The key concept of the Sanders [reference] is the necessity to raise the pH up to 12.5 pH of the extractant after [the] diffusion process (called [a] preliming step) to enable certain non-sucrose substances contained in juices to decompose and to reach their respective iso-electric point." The Examiner then goes on to state, in regard to both claims 1 (final Office Action p. 3) and 18 (final Office Action p. 6), that it would have been "obvious" to combine, "the teaching of Schultheiss of electroporation for sugar beets at low mechanical pressure with the teaching of Sanders of alkaline treatment of the first extracted liquid which still has biological materials after [the] diffusion process . . . ". Finally, at p. 8 of the final Office Action, in her "Response to Arguments", the Examiner states, "Sanders alkalinity treatment is for the liquids with solids still in the extractant after the first diffusion and the alkalinity treatment is to further extract out more liquids [that is, from the liquid (i.e., juice) already extracted from the biological material]." (emphasis in original).

The following discussion, however, is believed to conclusively demonstrate that instead of supporting the rejection based on the combination of Sanders with Schultheiss, the remarks quoted above from the final Office Action actually serve to highlight an important distinction

between the process as recited in, e.g., applicants' claims 1 and 18 and the process suggested by the combined disclosures of the two cited references.

As noted even by the Examiner, therefore, the combination of Schultheiss with the Sanders reference teaches one of ordinary skill in this field to separate juice from the plant material and then to subject the juice thus removed to an alkaline extraction, i.e., to remove non-sucrose substances contained in the juice thus removed. In contrast, however, both applicants' claims 1 and 18 (i.e., and those claims which depend therefrom) are directed to a process wherein, first, the biological material is electroporated, next the cell juice is separated off from the electroporated biological material and then the electroporated biological material from which the juice has been separated off is subjected to extraction, i.e., to remove additional plant juice which, in step (d) of both claim 1 and 18, is combined with the juice removed following the electroporation step.

It is apparent to applicants, both from the language adopted by the Examiner in the §103 rejection of, *inter alia*, claims 1 and 18, and from the Examiner's comments during the telephone discussion of this application on March 2, 2010 between applicants' representative and the Examiner (and her supervisor, Examiner Curt Mayes) that the Examiner is treating step (b) (of both claims 1 and 18) as constituting a further extraction of the juice removed from the biological material by the electroporation treatment. Applicants in their Amendment filed on June 2, 2009 amended the language of step (c) in an effort to clarify for the Examiner that in the presently claimed method it is the remaining electroporated material from which the cell juice has [already] been separated off in step (b) of the method that undergoes the extraction treatment.

In an effort, therefore, to clarify the meaning of the claim language for the Examiner, applicants' representative during the telephone discussion with the Examiners directed the Examiner's attention to p. 4, second full paragraph, of the as-filed specification. In summarizing the claimed process, the specification at the indicated location states that the cell juice of the electroporated biological material is separated off in step (b), after which the material obtained from step (b) is subjected to an extraction in a third step (c). Applicants' representative argued to the Examiner that the "material obtained from step (b)" referred to in the specification is the biological material from which the cell juice has been removed by electroporation. However, the Examiner expressed her disagreement with this assessment, alleging instead that, instead, the

term "material" relates to the juice withdrawn due to the electroporation – thus falling within the ambit of the disclosure found in the Sanders reference.

To further support applicants' contention that what is both taught and claimed in the present application is that the biological material is electroporated to remove therefrom an amount of juice and then it is the biological material and not the juice that is subjected to an extraction aimed at removing additional juice, the Board's attention is respectfully directed to the following locations in the present (as filed) specification which are believed to clarify that the term "material" on p. 4 refers to the (remaining) electroporated material. Perhaps the most detailed explanation is found on p. 15 of the specification at lines 16-23. The indicated portion teaches that electroporation of the biological material is carried out in a first step, "and an alkaline extraction of the electroporated biological material, in particular electroporated sugar beet or sugar beet chips, sugar cane or chicory, is carried out in a further step and extracted biological material having an increased [of the] ability to be pressed out [i.e., for removing excess water therefrom] is subsequently obtained." (emphasis supplied by applicants). The indicated passage alone should thus make it completely clear that the "material" which is extracted in step (c) of both claims 1 and 18 is the biological material. Further to the above, moreover, the Board is also requested to review p. 4, lines 29-32, p. 9, lines 11-23, p. 10, lines 14-18 and the portion of the text bridging pp. 15-16 of the specification which, in applicants' view, lead to the identical conclusion.

In sum, therefore, the passages referred to above are deemed by applicants to conclusively demonstrate that what is both taught and claimed in the present application is the extraction of the biological material remaining following the removal of some juice therefrom due to electroporation. This process, then, is clearly distinguishable from the disclosure contained in Sanders which, as noted above, teaches one to remove (by pressing) juice from the biological material and then to subject the juice thus removed to a further clarification treatment under alkaline conditions.

The difference between the disclosure contained in the Sanders reference and the process recited in applicants' claims is, moreover, not only the choice of material that is to be subjected to an alkaline treatment, but rather it involves the actual alkaline treatment itself. Sanders relates to juice purification using lime, i.e, carried out under alkaline conditions. This juice purification

takes place after the juice is obtained from a pressing step and/or a diffusion (i.e., extraction) step. In comparison to the presently claimed method, therefore, the teaching of Sanders refers to a processing step which is to be performed after step (d) of the presently claimed method. Sanders clearly distinguishes between an extraction treatment used to obtain an extract, i.e., cell juice and a subsequent alkaline treatment of the extract/cell juice that has been obtained. See, e.g., paragraphs [0006], [0030] and [0040] of the Sanders publication.

Clearly, therefore, the method recited in applicants' independent claims 1 and 18 is not suggested by the combination of the Schultheiss and Sanders references. The cited combination may teach one having ordinary skill in this art to electroporate plant material, then to separate off the cell juice thus released via the electroporation technique, following which the separated cell juice is subjected to an alkaline purification treatment. However, the subject combination neither teaches or even suggests that it is the electroporated biological material (as recited in the rejected claims) that undergoes the extraction, as referred to in step (c) of claims 1 and 18. Furthermore, neither Sanders nor Schultheiss contain any disclosure such that, when these references are combined, would suggest to one having ordinary skill in this art to modify the teaching of Sanders, i.e, to subject the plant material (i.e., the biological material), instead of the extracted juice, to an extraction treatment.

Accordingly, it is respectfully submitted that claims 1 and 18 are distinguished over the cited combination of Sanders and Schultheiss and that the rejection of these claims under 35 U.S.C. §103 over the prior art should be withdrawn. Furthermore, the remaining rejected claims, i.e., nos. 2, 6-9, 13, 15, 16, 19, 21 and 25-28 each depend from one or the other of claims 1 and 18. As such, the various rejected dependent claims each contain all of the features recited in the independent claim from which they depend. Therefore, these dependent claims are submitted as being distinguishable over the cited combination of references for the same reasons as claims 1 and 18. The Board is thus also respectfully requested to withdraw the §103 rejection of these dependent claims as well.

B. Claims 4, 5, 14 and 21-24 are non-obvious under 35 U.S.C. §103 (a) over the proposed combination of Sanders in view of Schultheiss and further in view of "Eugene et al." [*sic. Vorobiev et al.*] EP 1257413 (or WO 01/62482)

In ¶17 on p. 7 the final Office Action states that neither Sanders nor Schultheiss discuss the details of the feeding screw, despite that both of the references do use screw conveyors for the process of extracting liquids or sugars out of plant materials, such as sugar beets. The Examiner has thus combined these two references with EP 1257413 (WO 01/62482) which, it is alleged, discloses a method for extracting liquid from a cellular material . . . by a combination of low mechanical pressing (a screw conveyor) at 0.1 MPa and an electrical pulse device. The Examiner then goes on to state, further on p. 7, that Eugene [*sic.* Vorobiev et al.] discloses only a moderate pressure, essentially ranging between 1.105 Pa – 30 Pa and [that] it is unnecessary to use pressures during mechanical pressing (page 2) with a screw press.

Applicants respectfully submit, however, that contrary to the Examiner's assessment the Sanders reference does not disclose any conveying means for solids such as the biological material that is the subject of the process recited in the claims of the present application. That is, the Sanders reference, in applicants' view, does not disclose a full screw, or any other screw conveyor.

The additional ('Eugene et al.') reference, moreover, does not disclose a method/apparatus where cell juice is separated off from biological material in a manner wherein the biological material remains substantially unaltered in its form and its character, i.e., as recited in applicants' claims. The subject reference, in fact, discloses several pressing means, including a filter press (see, e.g., figures 1-4); a spindle press (see fig. 5A); a screw press (fig. 5B) and a band press (fig. 6). The reference, moreover, teaches to press biological material in such a way that it is significantly altered in its form and character. According to various passages found in the text of the reference, a filter cake (i.e., a "gâteau" in the French text) is obtained in every instance once pressing takes place.

Further to the above, the reference teaches one to apply pressure either before or during the electroporation treatment (see, e.g., claims 1 and 2), which is in contrast to applicants' claimed technique which recites the use of electroporation in a first step, followed by the separation of cell juice from the electroporated material in a separate, subsequent step.

In sum, therefore, applicants note that rejected claims 4, 5 and 14 each depend, directly or indirectly, upon claim 1, whereas rejected claims 21-24 depend from claim 18. Thus, the subject claims, by their dependence, include all of the features recited in, respectively claim 1 or claim 18 from which they depend. Thus, claims 4, 5 and 14 are clearly distinguishable over the combination of Sanders and Schultheiss.

Nor does the addition of EP 1257413 (WO 01/62482) serve to remedy the deficiencies, noted above, exhibited by the combination of Sanders and Schultheiss. That is, as noted herein, the European reference describes an arrangement involving the pressing of the biological material, such that – in opposition to what is recited in, for example, independent claims 1 and 18 from which the rejected claims depend, the biological material is significantly altered in both its form and character.

Applicants thus respectfully submit that claims 4, 5, 14 and 21-24 are, for the reasons presented herein, not obvious over the cited combination of references cited to reject the subject claims. Thus it is respectfully requested that the rejection of those claims under §103 be overturned by the Board.

C. Claims 10, 11 and 12 are not obvious under 35 U.S.C. §103(a) over the proposed combination of Sanders and Schultheiss

Claims 10, 11 and 12 are apparatus claims, with claim 10 being the "main" apparatus claim. The subject claim recites a device for isolating ingredients from biological material according to the method as claimed in claim 1. According to the subject claim the device comprises at least one appliance for electroporation (1) and at least one extractor (8), wherein at least one full screw (5) for receiving the electroporated biological material is arranged between the appliance for the electroporation (1) and the extractor (8), said full screw (5) configured to separate off the cell juice from the electroporated material under a sufficiently low mechanical loading such that the biological material remains substantially unaltered in its form and character and is consequently supplied to the alkaline extraction treatment step in such substantially mechanically unaltered form.

According to item (b) in the Examiner's Response to Arguments as set forth on p. 8 of the final Office Action, "Sanders and Schultheiss already disclose a full screw conveyor". This is

not so, however, as argued in part (B) above, the applicants submit that the Sanders reference does not disclose any conveying means for solids such as the biological material used in the presently claimed method. That is, the Sanders reference does not, in applicants' view, disclose a full screw or any other screw conveyor.

The Examiner then subsequently states, moreover, in the final rejection that the references also discuss low mechanical loading. The latter comment is believed to relate to the requirement in, e.g., claim 10 that the mechanical loading is sufficiently low such that the biological material remains substantially unaltered in its form and character and is consequently supplied to the alkaline extraction treatment step in such substantially mechanically unaltered form.

In response, applicants respectfully direct the Board's attention to the fact that claim 10 is dependent upon claim 1. Thus claim 10 includes all of the features contained in claim 1, including the aspect that the juice is first removed from the electroporated biological material and then the remaining electroporated biological material (not the extracted juice) is subjected to an alkaline extraction using at least one suitable solvent at a pH of from about 7 to about 14, to produce a liquid extract, which is then combined (in step (d)) with the juice removed in step (b) after the electroporation technique. The fact that it is the electroporated biological material, and not the extracted juice, that undergoes the alkaline extraction (see claim 1, sub-paragraph c) is rendered even clearer due to the language of claim 10 which recites, as indicated above, that the biological material, that remains substantially unaltered in its form and character is consequently supplied to the alkaline treatment step.

Applicants thus reiterate the argument, made above in part A hereof, to the effect that the Sanders reference teaches one to press the plant material to remove (at least some of) the juice therefrom, and then to further undertake to clarify the juice thus removed by means of an alkaline treatment step. Neither the Sanders reference taken by itself, or in combination with Schultheiss, however, would teach or suggest to one having at least an ordinary level of skill in this art (see, e.g., the discussion in "A" above) to utilize the method recited in, e.g., claim 1 wherein, as established herein, it is clearly the remaining biological material that is subjected to the further extraction step, and not the juice removed in the earlier electroporation step. As taught, moreover, at p. 8 of the present specification, lines 20-26, with the use of applicants'

claimed process there is no need to submit the juice removed via the electroporation technique to a further extraction, in contrast to the teachings contained in Sanders. That is, as taught by the specification at the indicated location, "because of the low mechanical loading, the cell juice which is separated off in step b) is essentially clear and not contaminated with the tissue constituents, in particular suspended substances, etc. which inevitably emerge in connection with high mechanical loading, and can therefore be isolated in particularly pure form".

Applicants thus respectfully submit that, for the reasons presented above, none of their claims 10, 11 and 12 would be suggested by, i.e., obvious over, the combination of Sanders and Schultheiss. As such, the Board is respectfully requested to overturn the Examiner's rejection of the subject claims under 35 U.S.C. §103.

D. Claim 17 is not obvious under 35 U.S.C. §103 (a) over the proposed combination of Sanders and Schultheiss taken together with Eugene et al. [*sic. Vorobiev et al.*] EP 1257413 (or WO 01/62482)

Claim 17 is written in dependent form, depending on claim 10 which, in turn, as indicated above, depends from claim 1. Claim 17, therefore, includes all of the features recited in both claim 10 and claim 1. Claim 17 thus is distinguishable over at least the combination of Sanders and Schultheiss based on the reasons presented in part C above.

Nor does the addition of the 'Eugene et al.' European/International reference remedy the deficiencies, noted above, inherent in the combination of Sanders and Schultheiss. That is, the addition of this additional reference does not overcome the teaching of Sanders which would lead one of ordinary skill in the relevant art to undertake to further extract the juice pressed (or electroporated) from the biological material, and not the biological material itself, as recited for example in claim 1. The discussion above concerning the deficiencies in the combination of Sanders and Schultheiss is specifically incorporated by reference herein as well.

Again, as indicated in Part B above, In ¶17 on p. 7 of the final Office Action the Examiner states that neither Sanders nor Schultheiss discuss the details of the feeding screw. However, applicants reiterate their position – as already detailed in parts B and C above – that contrary to the Examiner's statement(s) re: the disclosure of Sanders concerning a feeding screw, Sanders in fact does not disclose any such conveying means for solids such as the biological

materials that are the subject of the present invention. There is no disclosure in the subject reference with regard to a full screw or other screw conveyor, i.e., capable of transporting such biological materials.

The Examiner has combined Sanders and Schultheiss with EP 1257413 (WO 01/62482) which, it is alleged, discloses a method for extracting liquid from a cellular material . . . by a combination of low mechanical pressing (a screw conveyor) at 0.1 MPa and an electrical pulse device. The Examiner then goes on to state, further on p. 7, that Eugene [*sic.* Vorobiev et al.] discloses only a moderate pressure, essentially ranging between 1.105 Pa – 30 Pa and [that] it is unnecessary to use pressures during mechanical pressing (page 2) with a screw press.

At p. 12 of applicants' Amendment dated October 6, 2009 (i.e., in response to the Examiner's Office Action dated June 23, 2009), applicants argued that the Eugene et al. (i.e., Vorobiev et al.) reference does not disclose the use of a full screw for conveying biological material from the electroporator to the diffusion extraction state, in contrast to what is recited (e.g., in claim 10) by applicants. On the contrary, the reference refers to "pressing means", such as a screw press (Fig. 5B) rather than "conveying means". To understand how applicants' claims are distinguishable, it is important to comprehend the distinction between a screw press which is used for pressing (and which thus does not maintain the biological material in a substantially unaltered state as to its form and character) - as taught for use by the reference, and a full screw used for conveying. A full screw, i.e., as used by applicants, does not press the biological material. Rather, it serves to simply convey material from one place to another. A screw press, however, contains material in a confined volume, which is reduced as the material passes through the press which, true to its name, presses the material. This may be seen, for example, in Fig. 5B of the reference wherein the spindle of the screw press is depicted as having a conical shape. In contrast, a full screw (as used by applicants) does not decrease the space available for the material thus conveyed and, thus, it does not exert any pressure on such material.

To illustrate the above distinction, provided with this Appeal Brief as Attachment A are several schematic drawings illustrating examples of full screws for comparison against Attachment B, which is a copy of the screw press in Fig. 5B of the cited Vorobiev et al. reference (WO 01/62482). These Attachments were originally submitted with the October 6, 2009 Amendment which was subsequently entered by the Examiner. Applicants note that one of the

figures (i.e., the second figure) in Attachment A contains text in the German language. For the convenience of the Board, therefore, also submitted in Attachment A is a copy of the second figure thereof wherein the German-language terminology has been translated into English. This 'modified' version of the figure in Attachment A was not included with the submission on October 6, 2009 but is offered herein to assist in clarifying for the Board what is shown in the figure contained in Attachment A.

Notwithstanding the arguments related above, however, the Examiner in the final Office Action stated on p. 8 in item (b) of the "Response to Arguments" that (1) Sanders and Schultheiss already disclose a full screw conveyor; and (2) even if the screw conveyor of 'Eugene' is different from the full screw conveyor, as long as the pressure range setting is disclosed – low mechanical loading – then the teachings are obvious. This is so, according to the Examiner, "because the claim is a method claim and not an apparatus claim". However, claim 17 which is rejected under 35 U.S.C. §103 (a) based on the combination of Sanders, Schultheiss and 'Eugene' is, in actuality, an apparatus claim and not a method claim.

Further to the above, moreover, as applicants have pointed out earlier in this discussion (see, e.g., Part B above) 'Eugene' (Vorobiev et al.) does not disclose a method or apparatus wherein cell juice is separated off from biological material in a manner wherein the biological material remains substantially unaltered in its form and character, i.e., as recited in claim 10 and claim 1, from which the rejected claim 17 ultimately depends. The reference discloses several pressing means, including a filter press (figs. 1-4), a spindle press (fig. 5A), a screw press (fig. 5B) and a band press (fig. 6). None of these pressing devices would be deemed to treat the biological material in a manner such that it remains substantially unaltered in its form and character, as presently claimed. Still further, the references in the text to the formation of a "filter cake" (see, e.g., pp. 3 - 5 of the English translation referring to the formed "cake" created due to the action of the presses) provides still additional evidence that the effect of the pressing would be to significantly alter the form and/or character of the biological material.

Applicants respectfully submit, therefore, that for the reasons presented above, claim 17 also would not be obvious over the cited combination of references relied upon by the Examiner to reject the claim. The Board is, thus, respectfully requested to withdraw the rejection of the claim under 35 U.S.C. §103(a).

VIII. CONCLUSION:

In view of the foregoing, it is respectfully submitted that claims 1, 2, 4-19 and 21-28 are Patentable over the cited references. Accordingly, it is respectfully requested that the decision of the Examiner finally rejecting claims 1, 2, 4-19 and 21-28 be reversed, and that this application be remanded with instructions to pass to issue.

Appellants reserve the right to request an oral hearing upon receipt of the Examiner's Answer.

THIS CORRESPONDENCE IS BEING SUBMITTED ELECTRONICALLY THROUGH THE PATENT AND TRADEMARK OFFICE EFS FILING SYSTEM ON August 12, 2010.

MAF:ck

Respectfully submitted,

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CLAIMS APPENDIX

Claims 1, 2, 4-19 and 21-28 are pending.

Claims 3 and 20 are cancelled.

Claims 1, 2, 4-19 and 21-28 are rejected under 35 U.S.C. §103(a).

Claims 1, 2, 4-19 and 21-28 are subject to the present appeal.

1. (Previously Presented) A method for isolating ingredients from biological material, comprising the steps of:

a) electroporating biological material,

b) separating off cell juice from the electroporated biological material under a sufficiently low mechanical loading such that the biological material remains substantially unaltered in its form and character and is consequently supplied to a subsequent alkaline extraction treatment in such substantially mechanically unaltered form,

c) subjecting the electroporated biological material from which the cell juice has been separated off in step b) above to an alkaline extraction treatment in which ingredients of said biological material are dissolved out of said material by contacting the material with at least one suitable solvent at a pH of from about 7 to about 14 to produce an extract,

d) obtaining the ingredients of the biological cell material in the cell juice and in the extract.

2. (Previously Presented) The method as claimed in claim 1, wherein the biological material in step a) is subjected to a high voltage field in a conductive medium.

3. (Canceled)

4. (Previously Presented) The method as claimed in claim 1, wherein mechanical pressurization of the biological material is always less than 0.5 MPa.

5. (Previously Presented) The method as claimed in claim 1, wherein step b) takes place in a screw.

6. (Previously Presented) The method as claimed in claim 1, wherein, in step b), the biological material is supplied with at least one auxiliary substance.

7. (Previously Presented) The method as claimed in claim 1, wherein step c) is carried out at a temperature of from 0 to 65°C.

8. (Previously Presented) The method as claimed in claim 1, wherein the biological material comprises at least one of sugar beet (*Beta vulgaris*) and sugar beet chips.

9. (Previously Presented) The method as claimed in claim 1, wherein the biological material comprises chicory.

10. (Previously Presented) A device for isolating ingredients from biological material according to the method as claimed in claim 1, said device comprising at least one appliance for electroporation (1) and at least one extractor (8), wherein at least one full screw (5) for receiving the electroporated biological material is arranged between the appliance for the electroporation (1) and the extractor (8), said full screw (5) configured to separate off the cell juice from the electroporated material under a sufficiently low mechanical loading such that the biological material remains substantially unaltered in its form and character and is consequently supplied to the alkaline extraction treatment step in such substantially mechanically unaltered form.

11. (Previously Presented) The device as claimed in claim 10, wherein the at least one full screw (5) is designed as a conveyor screw and wherein a first section of the screw which is designed for receiving the electroporated biological material is formed at a lower point, and a second section of the screw which is designed for releasing the conveyed biological

material is formed at an upper point, of a gradient which exists between said first and said second sections.

12. (Previously Presented) The device as claimed in claim 10, further comprising at least one metering device (6) for metering auxiliary substances.

13. (Previously Presented) The method as claimed in claim 1, wherein said mechanical loading comprises tumbling.

14. (Previously Presented) The method as claimed in claim 5, wherein said screw is a full screw.

15. (Previously Presented) The method as claimed in claim 6, wherein the auxiliary substance is at least one of lime and milk of lime.

16. (Previously Presented) The method as claimed in claim 7, wherein step c) is carried out at a temperature of from 45 to 60°C.

17. (Previously Presented) The device as claimed in claim 10, wherein the full screw is threaded and at least one of an outer jacket of said screw and said screw threads is perforated.

18. (Previously Presented) A method for isolating ingredients from a biological material selected from the group consisting of chicory and sugar cane, said method comprising the steps of:

a) electroporating the biological material;

b) separating off cell juice from the electroporated biological material under a sufficiently low mechanical loading such that the biological material remains substantially unaltered in its form and character and is consequently supplied to a

subsequent solvent extraction treatment in such substantially mechanically unaltered form;

c) extracting the biological material from which the cell juice has been separated off in step b) above by dissolving ingredients out of the material upon contacting the material with at least one suitable solvent; and

d) obtaining the ingredients of the biological cell material in the cell juice and in the extract.

19. (Previously Presented) The method as claimed in claim 18, wherein the biological material in step a) is subjected to a high voltage field in a conductive medium.

20. (Canceled)

21. (Previously Presented) The method as claimed in claim 18, wherein said mechanical loading comprises tumbling.

22. (Previously Presented) The method as claimed in claim 18, wherein mechanical pressurization of the biological material is always less than 0.5 MPa.

23. (Previously Presented) The method as claimed in claim 18, wherein step b) takes place in a screw.

24. (Previously Presented) The method as claimed in claim 23, wherein said screw is a full screw.

25. (Previously Presented) The method as claimed in claim 18, wherein, in step b), the biological material is supplied with at least one auxiliary substance.

26. (Previously Presented) The method as claimed in claim 25, wherein the auxiliary substance is at least one of lime and milk of lime.

27. (Previously Presented) The method as claimed in claim 18, wherein step c) is carried out at a temperature of from 0 to 65ºC.

28. (Previously Presented) The method as claimed in claim 27, wherein step c) is carried out at a temperature of from 45 to 60ºC.

EVIDENCE APPENDIX

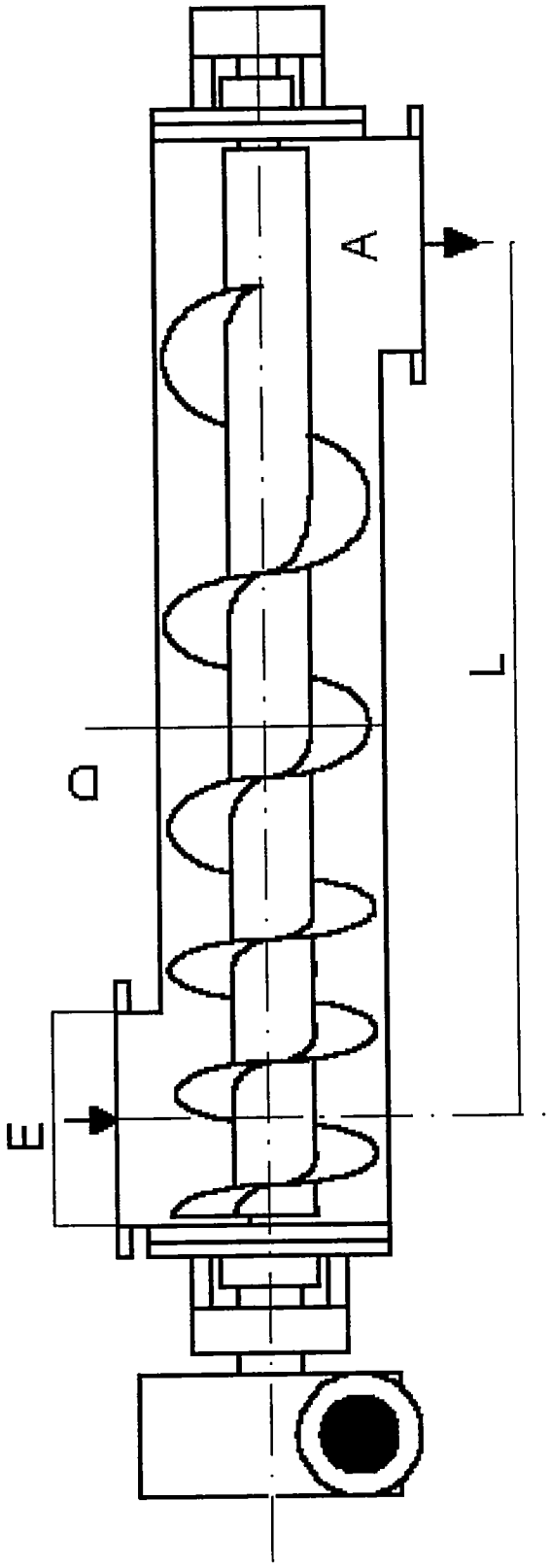
Two Attachments were provided with Applicants' Amendment filed via EFS – WEB on October 6, 2009 to support the ground for distinction discussed at p. 12 of the subject Amendment.

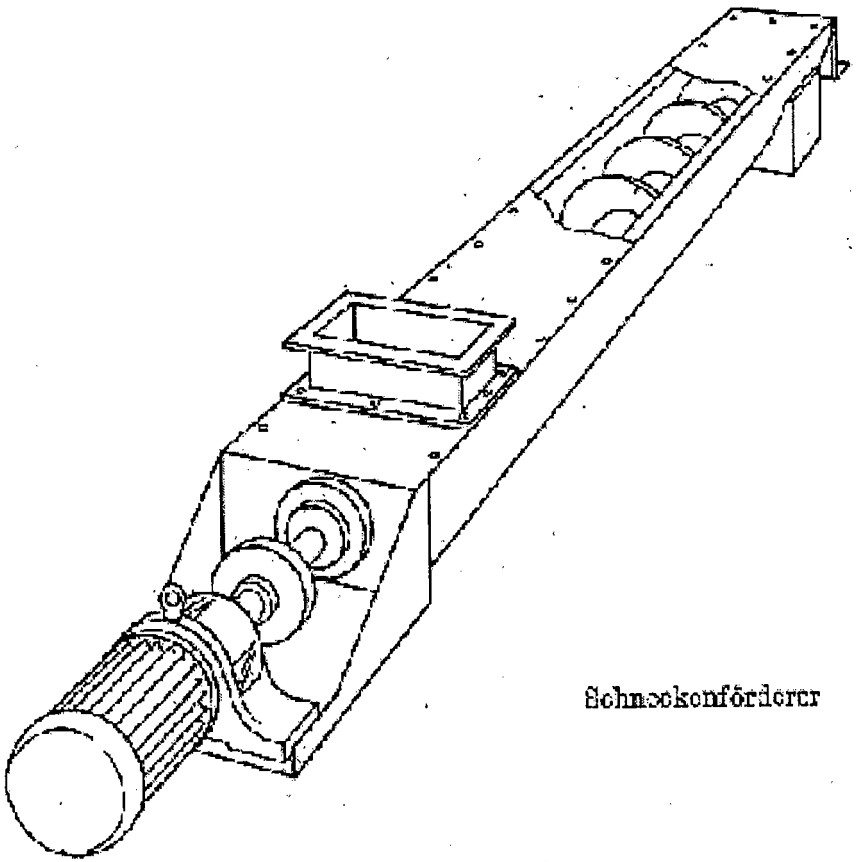
Attachment A provided with the October 6th Amendment comprised several schematic drawings illustrating examples of full screws. A copy of the second figure from Attachment A is provided with the German text translated into English. This copy, i.e., with the translation, was not previously provided to the Examiner during prosecution of this application but it is enclosed herein for the convenience of the Board.

Attachment B is a copy of Fig. 5B (illustrating a screw press) from International Publication No.: WO 01/62482 (Eugene et al.) cited by the Examiner to reject applicants' claims.

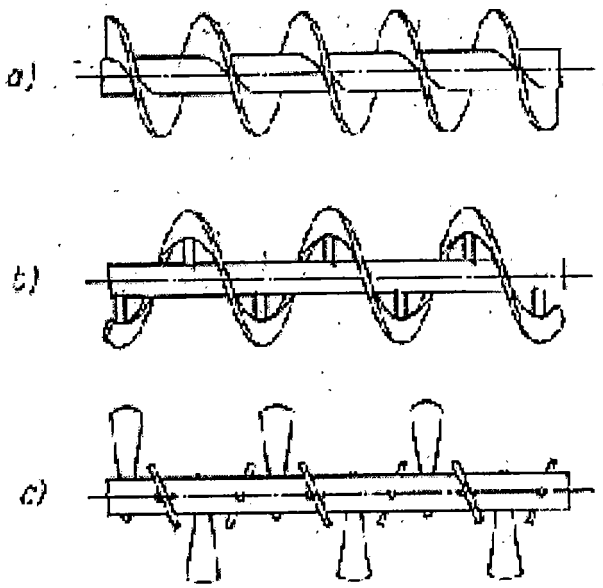
In the final Office Action dated December 18, 2009 the Examiner indicated that the October 6, 2009 Amendment was entered. Copies of the Attachments (A and B) submitted with the October 6, 2009 Amendment, and the copy with the translated text (not previously submitted or entered, as discussed above) are thus provided herewith.

ATTACHMENT A


A
L
D
E

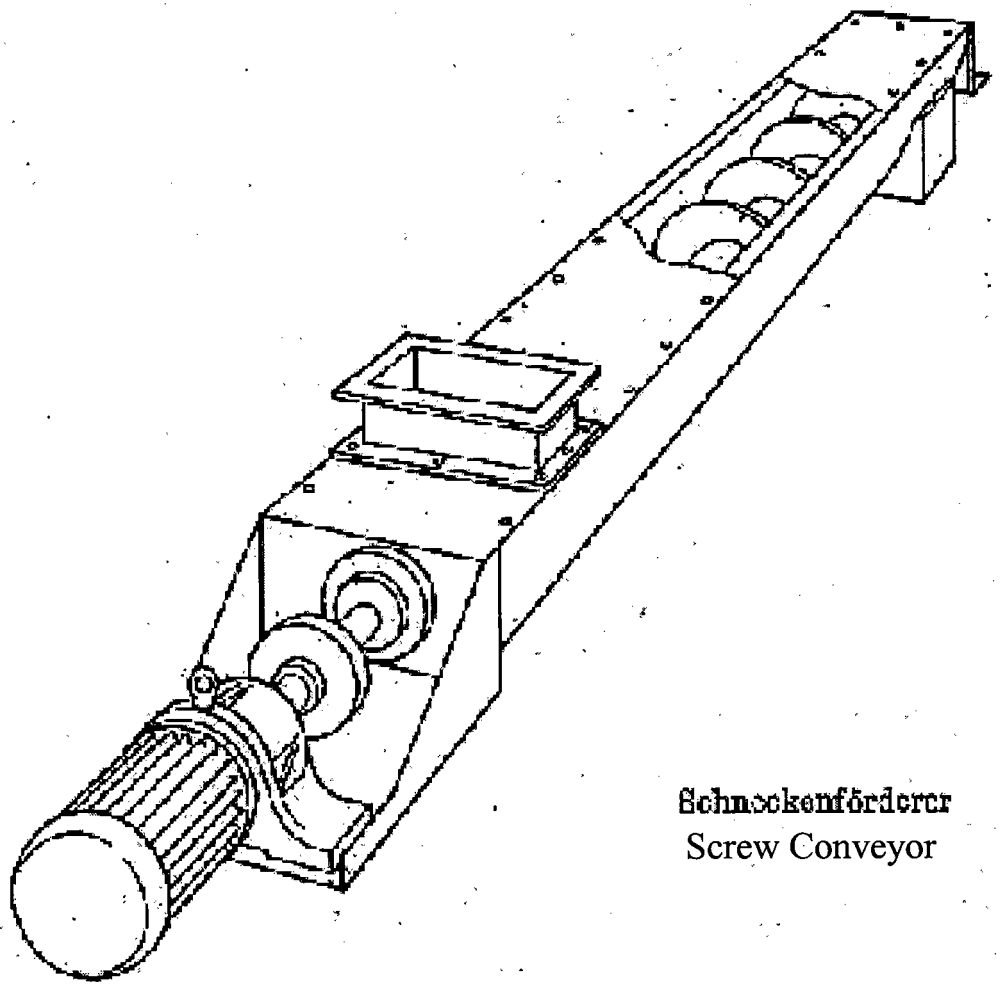


Schneckenförderer

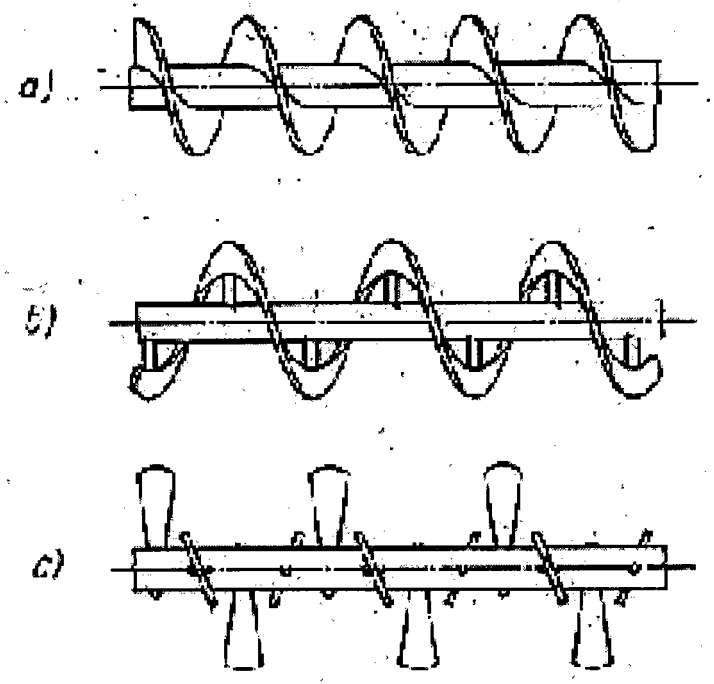


Schneckenarten

a) Vollschnecke
b) Bandschnecke
c) Segmentschnecke



Schneckenförderer
Screw Conveyor

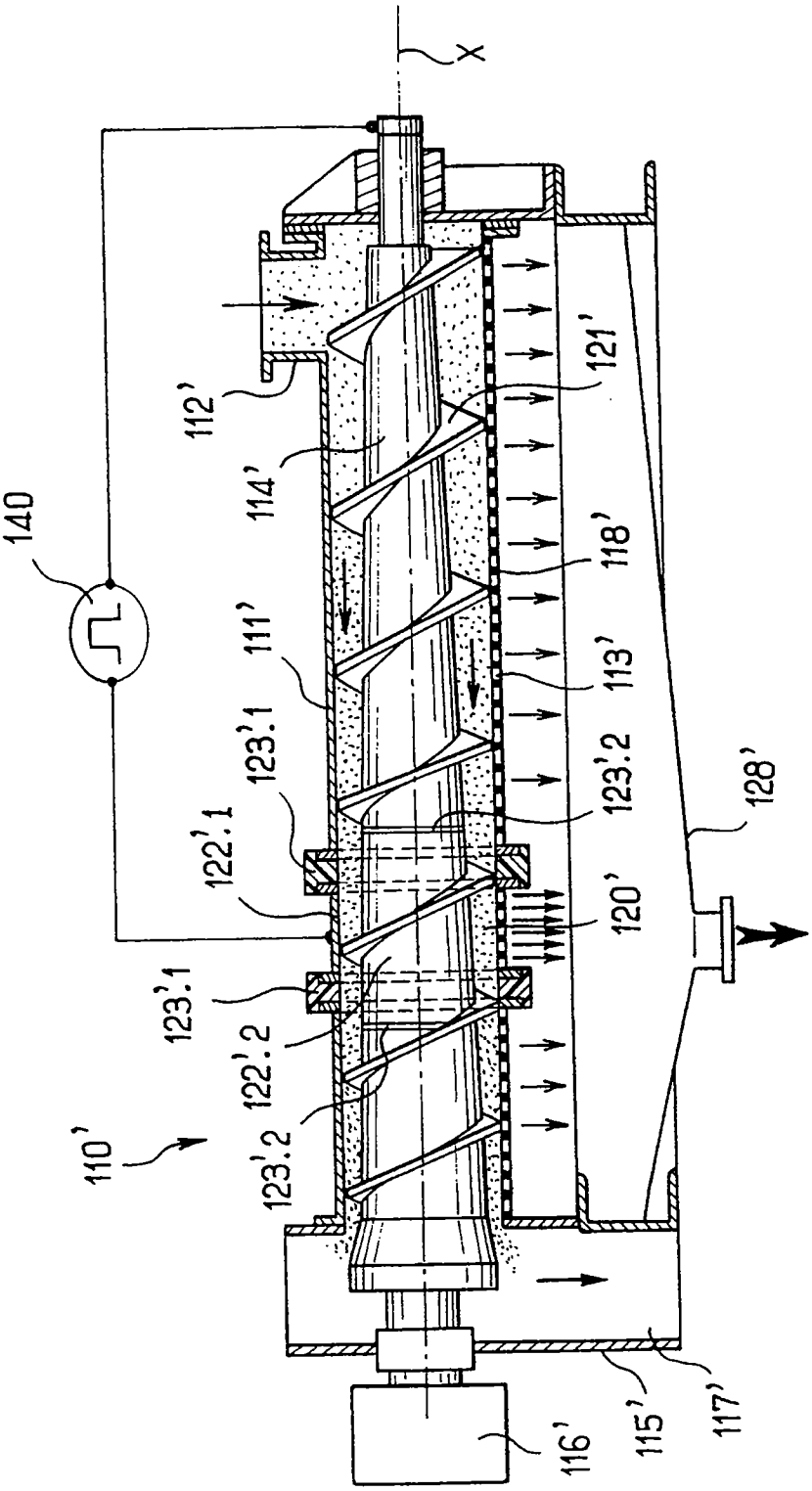


Schneckenarten
a) Vollschnecke c) Segmentschnecke
b) Bandschnecke

Screw Types
a) full screw c) segment screw
b) band screw

ATTACHMENT B

FIG_5B


X
140
112'
114'
111'
123'.1
122'.1
123'.1
122'.2
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123'.2
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115'
117'

RELATED PROCEEDINGS APPENDIX

None